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Weld organized effort into effective team play

The Growing Importance

► When we talk about business systems today we are talking about a kind of teamwork. A business organization, like a successful football team, needs a series of team plays. The welding together of the many highly specialized skills and personalities that we find in an organization of hundreds or thousands of people is not an easy task, but it is an essential one. Business systems help to weld organized effort into effective team play because there is a systems plan.

What is a systems plan? Allen Davis, national president of the Systems Association, has stated: "Systems work is a professional staff type of work concerned with research, analysis, development, problem-solving, and assistance to management." The systems man is the man to whom management looks for professional staff guidance in the following areas: (1) organizational planning; (2) analysis, simplification, or establishment of operating systems and procedures; (3) work simplification; (4) work measurement; (5) time and motion study and incentives, usually in the clerical or "office" areas; (6) procedure and manual writing; (7) forms analysis, design and control; (8) records management; (9) space and facilities planning and control of utilization; (10) report analysis and control; (11) equipment evaluation and selection, with some standardization.

Leslie Matthies is Supervisor of Administration Services-Engineering at Northrup Aircraft, Inc., and is a National Director of SPA.

Significant Statement

What do people think of systems? A very capable electronics engineer had this to say: "I believe I could take a job in a systems department and do good systems work without much trouble; but I doubt if a systems man could step into my job and do it without much trouble."

The man who made that statement was an intelligent man. What he said has a lot of significance both in what is wrong in systems and why we have too many poor systems programs.

What was this engineer saying? That he thought there was really nothing much to the art of systems, and that systems probably was not too important anyway. This idea is all too common.

Some accountants believe that systems is either a part of accounting, or is the same as accounting.

The man at the working level knows that we write procedures, many of which he cannot read or understand. He knows he contacts us when he wants a

by Leslie Matthies

# of Business Systems

printed form. He often dubs us with that horrible title, "efficiency expert."

What does the manager think of systems? A manager once said to a systems man: "Systems always sounds like an excellent idea but I have never seen it work anywhere."

Others believe that paper work is a form of production and that office work is production. It is utter nonsense to regard paper work as production. It is not and never should be. Paper is a guide, a control, and a command. And how can you consider guides, controls and commands as "production"?

paperwork problem

How did the systems profession develop? Prior to 1937 there were very few systems and procedures departments as such. Some larger companies, particularly insurance and oil, had taken tentative steps to master the "paperwork problem," for example, and by the end of World War II managements everywhere had found it necessary to establish some type of agency to control the paper work Frankenstein.

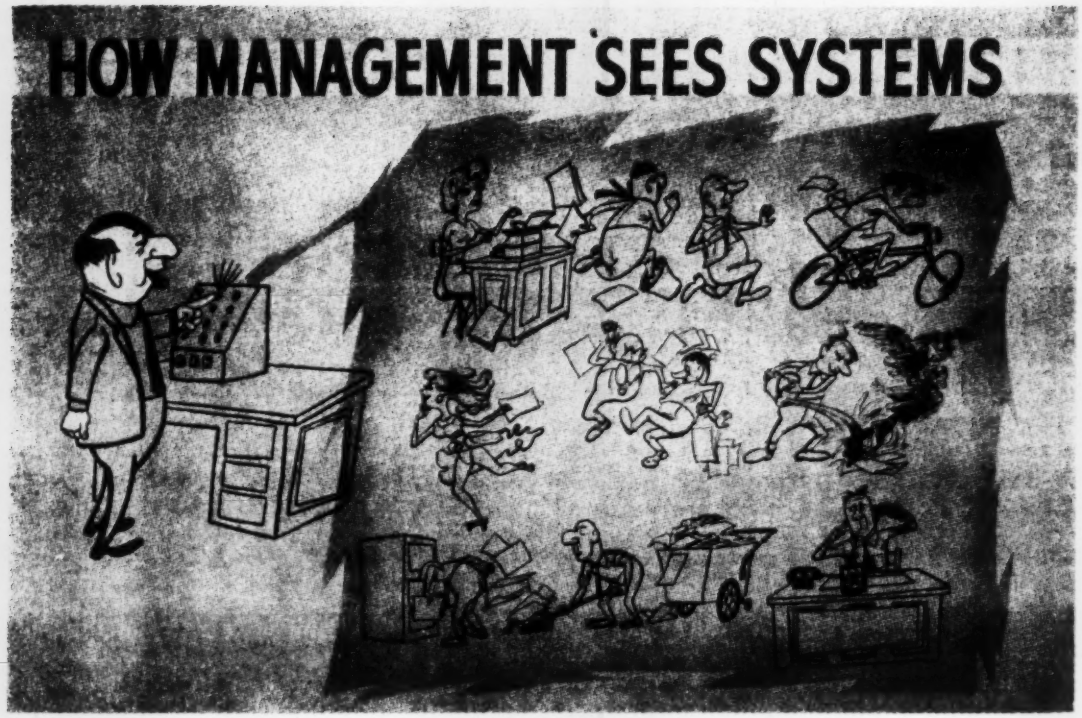
It wasn't long after the war that managements realized that they had made a mistake in ridding themselves of systems groups established during the emergency, and found that they had no agency that could assist in coordinating complex skills into team play.

It was the need to control paper that sparked the embryo profession of systems and procedures. It was found in one large industrial company that four thousand forms were in use, only seven percent of which were being used within the controller's division. Paper formerly used as a means of financial control within the accounting division had been taken over by administrators in all parts of the organization, and as a result there was a tremendous slowdown in paper flow.

In the meantime the first systems and procedures chapter had been established in Philadelphia, and in 1945 a similar chapter was set up in New York City. Both chapters joined in 1947 to form the present Systems & Procedures Assn. of America.

What is Systems? Systems is management's forgotten duty. We may find it difficult to accept the idea that systems is actually one of management's duties because most of us concentrate on the numerous details of systems work without planning what we are really trying to do. We should try to find the simple pattern in the mass of detail. There is a great thirst in the systems field today for how-to-do-it information. Certainly we need a great deal of this how-to-do-it knowledge, but we can also make the mistake of concentrating too much on the how-to-do-it. We can lose sight of the broader concept of our systems objectives.

continued



Do we want systems to become a better science of clerking, or do we want it to become a better science of management planning? Think of the present systems picture, with manuals, forms, machines, computers, clerks, layouts, procedures, quality control, records management, office standards, integrated data processing, and charting techniques. Can you blame the top executive for not being able to see a pattern in all this?

Systems has before it the opportunity of becoming one of the greatest of management techniques. For this reason it is a temptation for the profession, during its formative period, to take into the professional family other fine management techniques, such as plant suggestions, the internal print shop, the telephone room, steno pools, the stationery stockroom, auditing, office facilities, auto parking, statistics, budgets, and operations research. Why, when we have an exciting, vital field, should we not develop our profession in depth, rather than spread out and take in more functions?

Business is getting more complicated. The boss must turn more and more to systems as a management staff function, and he needs our assistance as staff men to help him control the many complicated activities, weld them together, and steer them toward a common goal.

Goal: Well-Planned System

Systems develops techniques which, when the boss accepts them as his own, are truly his and not the systems man's. So let's set our goal toward one vital element of the management picture—the establishment and maintenance of the well-planned system. We will then not be guilty of confusing our managements as to what we think we should do for them.

If we agree that systems work must be done by defining and isolating definite sys-

tems cycles, and then improving these cycles, it is also essential that we consider the interrelationship of systems cycles.

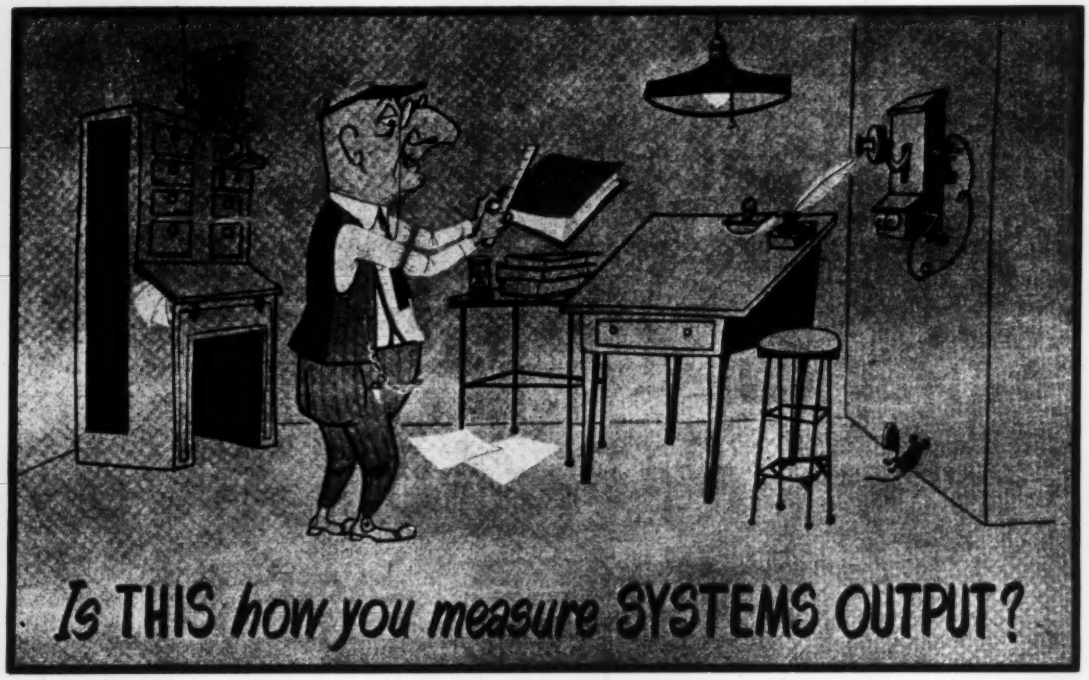
What device do we need to help us keep a mental picture, to help us see the interconnections of the data that is flowing through our vast network of communications systems? One device is a master chart that traces all work authority flow. The flow starts with the time the customer's order comes in the door. The flow ends with the customer's check in payment for the shipment. The flow sequence consists of mounted samples of the actual authority forms, such as the sales order, the engineering order, the purchase order, the shop order, and the shipping papers, all connected by red cellophane tapes. This master chart provides a perspective to which can be related all other systems or procedural cycles.

To get a clean system you must isolate, identify and define the procedural cycle that you are considering. Within this cycle three types of systems action must take place. The first of these actions is the release of authority. The second step in the system cycle is the record. This record is set up at a selected point. The third phase is the report. The action had a start, an intermediate process and it had an ending. Altogether, it constitutes the system cycle.

Find the Ending

If you are struggling in a maze of details in a large organization, you have to look for a system cycle that is basically just as simple as this. If you cannot find a clear cycle pattern at first, keep searching until you do. Everything in business has got to make sense. Every action starts somewhere and has to go somewhere, and then stop. Find that ending and then find out what goes on in between. Then you have a "fix" on your procedural cycle. Once you get such a "fix," no one is going to confuse you.

continued



You have been in a systems meeting and you know that people can go off on all kinds of tangents. Therefore, before going into a meeting of this kind, dig out your cycle and fix it in your mind. If you do this, no matter how many tangents people in attendance go off on, you can always pull them back to the subject at hand. You can insist that the system must stay on a relatively straight path to the objective.

The systems man's attitude is the same attitude that the boss has. They both want everyone in the organization to succeed. The systems man doesn't favor one operation over another. He is fair. The information that he gets during his survey is never used against anyone. He regards such information as confidential. He gathers it so that he can help the man in direct charge to do a better job.

Systems must be tailor made. Many systems fiascos have resulted because people have tried to adopt a system that worked in another company. Systems can be adapted but almost never adopted.

Each system requires individual analysis. K. G. Belbeck, writing in the *Systems and Procedures Quarterly,* sets forth Pareto's law as:

> "In any series of elements to be controlled, a selected fraction in terms of number of elements always accounts for a large fraction in terms of results."

Mr. Belbeck then offers an example of the requirement for thinking out each system on its individual merits. One company has a relatively large inventory of purchased parts. Visible records were maintained on every item, regardless of its value. A systems analysis showed that 70 per cent of the records controlled only 10 per cent of the value of the inventory. The inventory value was $50,000. Therefore, the company was expending 70 per cent of its inventory record labor to control only $5,000 worth of inventory. Analysis showed

that the company was paying out $2,500 per year to keep records on a $5,000 inventory.

A wise systems man will scrupulously avoid injecting himself into the line of authority flow. He is a staff man, working in a systems that will affect the line operation.

A capable systems crew need not be large. It can serve best in a staff capacity as catalysts, and should serve as consultants to the operating supervisors. The real difference between a systems man and an operating supervisor is that the line supervisor concentrates on his own operation. His viewpoint has a narrower scope. The systems man, on the other hand, must retain the same viewpoint as the top brass—the broad viewpoint, and while retaining this viewpoint the systems man can reconcile the needs of each operating supervisor.

The operating supervisor must be given utmost operating latitude within the scope of the systems plan. In this way individual initiative can be applied to the internal operation of each department. The boss will then be able to delegate great freedom to the individual without fearing any loss of vital control.

The use of electronic computers will result in heavy demands for trained systems personnel, and the present shortage of capable systems men will become more acute during the next three or four years. If systems quacks or misguided people filter into a vacuum of this type the systems profession's reputation can suffer great damage.

What can be done about this? The systems man should train himself for a position as a systems manager, who is a combination of several things. He must be an executive. He must know how to work through other people. He must be able to understand what systems really is or what it can be. He must have vision. He must have technical knowledge so that he may have full appreciation of the various facets of a systems operation. He cannot overlook forms design, electronic computers, and more readable procedures. He must know such things as forms control techniques, survey techniques, and the technique of isolating and working on selected systems cycles. And he must be able to teach.

There is no better place in any business organization where a future top manager could spend a year more profitably than in the systems operation. If he is guided by a capable systems manager the embryo executive can achieve worthwhile systems gain for his company and at the same time receive fine training for his future job.

The systems man is in one of the best positions to see and to understand the interrelationships of these complex specialties. He is likely to appreciate the value of all the other activities and where they fit into the overall picture. He is the one man who should recognize the relative value of all work, from that of sweeping the floor to that of rendering long-range policy decisions in the president's office. **s/p/a**

"Pan American's Electronic Data-Processing Center"
John S. Woodbridge, *The Controller,* October 1956.
Extract from a case study to be released by Controllership Foundation. Covers transition of accounting procedures, how tabulating personnel were approached, and input problems. Based on experience with an IBM 705.

"A Springboard to Action!"
Leslie Matthies, *The Office,* September 1956.
Suggests that systems men should offer drafts to operating personnel for comment rather than request drafts from them. States that drafts make action more certain.

Teamwork in the Office

George H. Heller, Jr.

► "Teamwork" is nebulous and we'll examine the subject by finding out what it is, then whether it's essential, then if it *is* desirable or essential, how to obtain it. Everybody knows that by definition, Teamwork is the desire of two or more people to act together toward the achievement of a common goal.

How do you find out if you have teamwork in an office? Like everything else—you look—you listen—and you think.

If you get a little procedure change that affects several departments, could you give a copy to the department heads and expect the thing to be done with no further effort on your part? Do your people tell you things you want to know about or let you find out yourself? Do you get a lot of troublesome little problems or do they bring you answers for approval? Do some complain about others and try to pass the buck? How much do you have to arbitrate?

How essential is Teamwork? I don't think it is essential. You can get the job done for a long time with a small degree of teamwork and even show good results—for a while. It will be a constant, difficult job and embarrassing at times, but it can be done. Teamwork merely makes things easier. Teamwork is the difference between doing the job bcause you want to and doing it because you have to.

Managing a group that does the job because they have to is tough because the Manager is the "have to". He has to provide the power as well as the steering—like a bicycle.

Managing a group that does the job because they want to is easier because all you have to do is steer and fill the gas tank once in a while.

Continuous Teamwork in a high degree in any one Office is far from accidental. It is promoted, nourished, sustained and developed purposefully, intentionally, conscientiously and by design by the guy in the front office. And if he doesn't, a high degree of Teamwork won't exist.

The qualifications for successful promotion and development of Teamwork are precisely those of a good Office Manager and I would like to avoid an academic discussion of them because they are all neatly written down in many books on office management and everybody knows what they are. Two points, however, should be emphasized because they are essential and because they require some strength to perform.

(1) The total teamwork is often hampered by a few non-conformists. Sometimes one or two. These must be firmly dealt with. They have to be told that "getting along" is essential and that they better join the team and that there is no alternative. Stern dealings with individuals of this type will have an effect over a period of time. It's much easier to ignore them than to keep jumping on them, but you can't settle for the easy way and expect to succeed.

(2) It is just as important to give these few non-conformists your support as it is to harp at them. We must insist that the rest of the team accept, live with, and help

George H. Heller, Jr., is manager of the Macon, Ga., Processing Office of the North America Companies.

the weak links. And that isn't easy either. It can usually be done by continually pointing out to others the strong points of the recalcitrant ones. And, if we avoid this dirty duty we shirk a definite responsibility.

Finally, I would like to point out the obvious fact that people can't work to a common goal if they don't know what the goal is. If the expense ratio is too high, it's silly to hide the Operating Report in the Manager's office. Why shouldn't a department head get a copy of the part of the auditor's report that deals with his unit? I think that Teamwork must be built on information.

In summary, Teamwork in an office is a nebulous, volatile attribute, that it is highly desirable, and that it is obtainable only by direct and concerted effort on the part of the manager. **s/p/a**

Systemstep

► The need frequently arises for a date code of minimum length. Where it is permissible to use both numbers and letters, the following system has proven particularly useful.

The day of the month is coded with a single or double digit, depending on the need for uniform code length, i.e., the second day of the month would be coded either 2 or 02.

The first four and last four months of the year are coded with initial letters, JFMA and SOND. The middle four months are coded with the last four letters of the alphabet: May–W, June–X, July–Y, August–Z.

The year is coded with the last digit if permissible to renew the coding every ten years, e.g., 7 for 1957; or with the last two digits if the codes must be unique for more than a 10-year period.

The minimum length of date codes in this system is either three or four digits depending on the digits in the day of the month.

The above method of letter coding months presents the following advantages:

It permits a reduction in length by substituting a single digit for the customary two.

It relies primarily on initial letters; coding of the middle four months (the initials of which would duplicate those of months in the first four) can be readily learned with no memorization of code designations. Coincidentally, a mnemonic reference is present in this group: the Y code for July is the last letter of the name.

The code is written with the day first, then month and year so that the letter separates the numbers and removes any chance for confusion in reading. December 31, 1957 would be coded 31D7.

This reduction of a single digit, while appearing trivial at first glance, can represent a relatively substantial saving due to its exceptionally high frequency of use. The system lends itself to wide applicability for dating internal correspondence, punched cards, addressing plates, etc. It assumes major importance where vital information must be crowded into restricted space, a condition not unusual in the layout of punched card procedures. **s/p/a**

—By Richard W. Pomeroy, Fairbanks Associates, Inc.

Could your company remain in business if its records were destroyed at 3.15 PM tomorrow?

Selection and Protection of Vital Records

by Harold F. O'Neil

This material was developed for presentation at the December, 1956 meeting of the Bay State Chapter (Boston, Mass.) of SPA. This presentation consists of six units:

Introduction and Scope
Reason for the program
How to select your vital records
Examples of vital records
Vital records storage centers (methods of protection)
Summary

Harold F. O'Neil is Chief, Current Records Division, National Archives & Records Service, General Services Administration Regional Office, Boston 9, Mass.

Introduction and Scope

Why . . . your company can go out of business overnight if a certain protective program is not installed.

None of us, many of whom bear the scars of war service, like to think of nuclear bombings; so I shall direct our initial worries to "simpler disasters" such as:

floods-fires-tornadoes-hurricanes-sabotage action-earthquakes-riots-boiler explosions-thefts-defective water sprinklers-falling airplanes-petroleum leaks-and the like.

Too often, the remark is made "Oh, well, if one of those bombs hits our plant, none of us would be around anyway". But who said you were going to be involved in an enemy bombing? What about a fire caused by an overloaded wiring circuit at Christmas time, while you're on vacation in Ohio?

The plant burns to the ground Sunday morning, December 26th . . . now where do you go from there?

I would like to show that there is a relation between fire damages for example and business welfare that is very obvious. Dun and Bradstreet reports these alarming statistics:

1953 44 companies failed because of fires
1954 67 companies failed because of fires
1955 155 companies failed because of fires

Looking into another area, water damage, further figures reflect:

1954 9 companies failed because of floods
1955 77 companies failed because of floods

Meditating just for a short moment, one airplane now can leave a crater blocks wide by releasing just one "super bomb", so even the basement area is no longer a good place for your records. WW II history showed us that basements suffered their share of damages too, primarily from water used to fight the fires! !

Some observers have been greatly disturbed because comparatively few firms have attempted to select, segregate and preserve the *core* of essential records which are needed for continuance of all company functions and to prevent large financial loss in case of their destruction.

How . . . this core usually consists only of about 5-10% of your present record holdings; but they are always the type which concern *all* offices, divisions and departments.

continued

Consequently, the responsibility for carrying out the protection program should be assumed by the Systems man . . . who by nature of his position, is authorized to cross organizational lines and who has the big picture of his company's operations.

Reason for the Program

Unintended destruction of a company's records, whether by fire, theft, etc., is an event so disastrous that it forces out of business nearly half of the firms involved—either immediately or within a six-month period.

In addition to the cases of total collapse, a large percentage of firms able to resume operations never regain more than a fraction of the success that they previously enjoyed.

Even a partial loss, such as those of a single department, is fatal or crippling in many instances.

In most cases, the crack-up of companies from loss of records occurs despite their collection of insurance awards that otherwise would be large enough to permit a complete and rapid recovery.

Why does this loss of "paper" have such a profound importance? Here are six reasons:

(1) difficulty of obtaining full (and quick) indemnity when the records of insured assets have ceased to exist.

(2) credit impairment resulting from lack of records to show the amounts of accounts receivable and payable; also from the awareness of the lending agencies that further injury is almost certain to occur.

(3) the financial burden of recreating "general" records.

(4) the further financial burden of recreating records directly related to reconstruction of plant and equipment, and to a resumption of productive operations. (Must the company's architects completely redraw the plans and specifications of the plant? Will it be necessary for the firm's engineers to prepare new drawings of machinery? Will the laboratory need to repeat research work that previously required 7¼ years in order to prepare new sets of processing data and product specifications?)

(5) unwillingness or inability of former customers to resume their relationships after long delays have forced them to be under obligations to other suppliers.

(6) the company's loss of a preferred position with its suppliers.

In the foregoing ways I have tried to convey the concept that the loss of your records can be 10,000 times as much as the low cost of adequate protection of them.

How to Select Your Vital Records

By now you should appreciate how records play a big part toward enabling a firm to survive any disaster and *stay* in business.

What constitutes a vital record? It is about impossible to generalize and still cover each company represented here this evening. How to perform the selection is a matter of judgment, rather than of unvarying definitions. The value of a certain document in "X" company may be widely different from that of a similar document in "Y" company which is in a different type of business.

An Initial Selection Committee should be established to make the first reviews of recommendations submitted by operating heads, using the first basic principles outlined herein. The Committee should consist of:

Systems Man as Chairman
Attorney as Legal Advisor
Controller as Fiscal Advisor
Plant Engineer as representative of the technical areas
Safety Officer to counsel on safety and structural matters
Office Manager as representative of housekeeping type of records

Sales Director to advise on community facilities, field facilities, and transportation-communication setups.

The review of the records is simple if a records retention schedule has already been developed. If not, the committee must require that an inventory be made of all records holdings both at the "home office" and at field offices. After all, they will have to have some "shopping list" upon which to base recommendations. A simple Inventory Sheet can be locally developed containing this type of data:

Name or Title and Brief Description of File

Dept. heads payroll; originals of form 5678; bookkeeping machine prepared monthly; on cards 8" x 14".

Filing arrangement

Alphabetical by name of field plant and chronological thereunder by month.

Cubic footage

5

Date range

1940-1956

Duplication elsewhere

Carbon copy sent to plant concerned with monthly financial statement.

Location of file

Officers Pay Unit, Payroll Section, Fiscal Division

Building number

12

Extension number

278

Person in charge

John J. Brown

Date

12/12/56

Analyst

Harold F. O'Neil

After committee study, coordination with each department follows, then final review by top management. After acceptance, the next step involves the publication of a company-wide directive or handbook spelling out the program, what records are involved, who will handle the internal matters within each major operation, where records will be centralized for pickup and transfer to safe locale (s), etc.

What is involved in the specific selection of what records are to become the vital records? Well, the most realistic approach is by considering for each file-series what the effect on the company's continuity would be if the papers were destroyed or became non-usable. One has to think of records as being vital or NOT vital . . . there is no need for involved degrees of essentiality. A record is considered vital when it contains information that is needed to protect the interests of:

stockholders . . . employees . . . the public

Here are four factors to consider in the evaluation phase:

(1) the extent to which unavailability of the specific record would cause impairment of the collection of funds for the replacement of buildings, equipment and stocks that might be lost or damaged in the same incident of destruction.

(2) the financial impact that unavailability would have upon operating techniques and procedures, upon sales, upon services.

(3) the difficulty, time and cost of replacing the record.

(4) the problems that would be encountered if the unavailability were in violation of law or regulation.

In turn, the difficulty of replacement (item 3 above) is subject to four sub-topics:

(1) is the record completely irreplaceable.

(2) would reproduction costs be prohibitive.

(3) could it be reproduced quickly.

(4) would a reproduction be adequate in lieu of the original.

The approach to use in this analysis to determine what records are vital records,

continued

can be done in only one right way. The National Records Management Council of NYC recommends the "functional approach". Under this principle, the records to be protected are identified by analyzing the chief *operations* of the company, breaking each operation down into the functions that make it up (such as receiving, paying, bookkeeping and cost make up the fiscal operation), then pinpointing those few records around which the function exists. For example, take a manufacturing concern, we could say its main operations are:

Fiscal operation
a. receiving function
b. paying function
c. bookkeeping function
d. cost function
Sales operation
a. service function
b. advertising function
c. credit function
Engineering operation
a. laboratory function
b. repair-servicing function
Legal operation
a. contract management function
b. claims processing function
Manufacturing operation
a. purchasing function
b. producing function
c. testing function
Administrative operation
a. methods-office services function
b. personnel function
c. management function
Real property management operation
a. property inventory function
b. real estate function

The **fiscal operation's** function of "receiving" needs records like these to perform its mission:

invoices . . . credit memos . . . trial balances . . . shipping orders

The **manufacturing operation's** function of "producing" involves:

operation sheets . . . tool designs . . . tool specifications . . . plant layout drawings . . . machine maintenance manuals

The **administrative operation's** function of "personnel" should consist of:

seniority listings . . . retirement accounts . . . roster of personnel assigned to Reserve and National Guard units . . . job descriptions

The **fiscal operation's** function of "receiving" (or collection) on accounts receivable will serve to illustrate how the functional approach is carried through its objective. The point is to keep only those records without which operations cannot be reconstructed for lack of paper documentation. For instance, data on shipments are not needed; the carriers can supply this information anyway. But, your company must have the monthly accounts receivable trial balance listing all outstanding receivables; the accounts receivable invoices which show additional receivables accrued between trial balances; the credit slips showing what the customers paid against the bills in the period between trial balances. With just these records, your accounts receivable can be re-established.

There is also one set of documents that should be created specifically for the contingency of disaster and protected above all others . . . assignments, powers of attorney and legal authorizations required so as to reconstitute Boards of Directors, Officers, Operating Committees, etc., drawn from personnel at alternate locations. Usually key positions cannot themselves be dispersed from the main office/plant; so the documents specifying their substitutes must be dispersed instead. Otherwise, the firm may find itself without direction . . . The July-August 1956 issue of *HARVARD BUSINESS REVIEW* magazine (page 80) is quoted below as it tells a very appropriate story in this regard:

"Before the War, the Holland-American

Line set up the legal means for transfer of powers of attorney and complete operation authority, including control of ship movements, from its main office in Rotterdam to offices in Canada, NYC and Curacao. Alternate company officers and executive personnel were specified. Copies of vital documents needed to implement and carry out authority were dispersed to the offices in the Western Hemisphere. At the moment that the Germans crossed the border, authority was automatically transferred from the officers in Rotterdam to the designated alternates. So comprehensive and exact were the legal preparations, that the Germans yielded to the evidence presented to them by the ex-officers of the company and recognized the validity of the transfer of authority. Not only were enemy plans to take over the line as part of the program for turning Rotterdam into a Nazi port thus frustrated, but the ships, now under control of the alternate company officials, were available to serve the cause of the Western Allies".

8. To summarize the procedure for selection of vital records:

(1) designate the principal functions that comprise each company operation
(2) determine the records vital in each function
(3) the reason for such determination made known and where such records are presently located.

. . . then . . .

(4) explain how each record will be used to reconstruct each function, how the record will be protected, how frequently to be shipped to the Center, how to be filed thereat, and how long to be retained.

This data lends itself to a form-questionnaire for completion by the head of each operation and subordinate function . . . for subsequent review of the Initial Selection Committee to which I previously referred. As a crude example, the form would show:

Vital record	general ledger (form 1234)
Reason	to reconstruct the assets and liabilities of the firm
Location	control section, Finance Division, Room 61, Bldg. 48, Ext. 4
Method	evacuation of the original to the Center
Frequency	when two years old
Center filing	chronologically by fiscal year, in class "A" safe
Center retention	permanent

Examples of Vital Records, Arranged On A Functional Basis

(*not a complete listing*)

FISCAL

BOOKKEEPING:

General ledger–general ledger trial balance–monthly financial statement–bank deposit slips–checking account statements from the bank–internal and external audit reports

COST:

Labor distribution analyses–annual cost ascertainment reports.

PAYING:

Vouchers payable list–check and payroll registers – payroll summaries – employee earning cards–(not time cards)–salary and travel expense tables–social security deduction reports–credit union accounts and annual report–local, state and federal tax returns with supporting papers to include data on capital assets, depreciation, unusual business expenses and losses, withholding monies and the like.

RECEIVING:

Invoices–credit memos–trial balances–shipping orders.

ENGINEERING

LABORATORY:

Research notebooks (closed)–reports of experiments, tests and designs in progress –formulae, analysis and compound records.

continued

REPAIR AND SERVICING:
Blueprints – drawings – tracings – and sketches–specifications–models–prototype mechanisms–inspection reports of plant and machinery.

LEGAL

CLAIMS PROCESSING:
Register of claims for damages, injuries or overcharges–accident reports both personnel and vehicle–lawsuits under court action.

CONTRACT MANAGEMENT:
Contracts (all types including those for services)–license and royalty agreements –complete library set of govt. decisions such as Internal Revenue and Comptroller General–Insurance policies (life, fire, accident, health, vehicle, property, annuity, etc.)–will in the case of individual proprietorship or agreements in the case of partnership–patents, copyrights and trademarks including applications, grants and inventor's assignments.

PROPERTY

INVENTORY:
Cost value and present inventory values of plant, fixtures, office machinery, vehicles, goods finished and in process, real estate owned, etc.–property location index.

REAL ESTATE:
Deeds–lease/rental agreements–mortgages –maps, plans and layouts–reports of condition.

MANUFACTURING

PRODUCING:
Operation sheets–tool specifications–plant layout drawings, tool designs.

PURCHASING:
List of vendors–vendors' prices–material ledgers.

TESTING:
Test procedure sheets–test drawings and specifications.

SALES

ADVERTISING:
Mailing list of advertisers, agents, distributors, engravers, printers, and lithographers –outstanding orders for advertising in magazines, etc.–list of advertising material sent to dealers–inventory of advertising material in stock–copy of each used advertisement.

CREDIT:
Collection index–credit authorizations and related reports.

SERVICE:
Sales territory layout map–prospect index.

ADMINISTRATIVE

MANAGEMENT:
Capital stock ledgers–records (or stubs) of capital stock certificates–stock transfer registers–registered bond ledgers–records (or stubs) of bonds–charter and franchise –minutes of stockholders, directors and executive committee meetings–codes and cipher books–historical papers such as photos, newsclippings, charts, leaflets, advertisements, etc. concerning the establishment/merger, growth, new products business and community interests, awards, etc. –articles of incorporation–by-laws–transfer of authority–plan of succession of key officials–annual reports–list of stockholders and their holdings.

METHODS AND OFFICE SERVICES:
Organizational and functional charts for both peacetime and wartime operations– one copy of each company-developed manual, directive, leaflet, poster, charts, etc.–records retention schedule–inventory of records transferred to Centers and/or to field offices in "safe areas"–relocation planning file–telephone directory for each major city of interest to the company's business–list of major sources of supply for administrative equipment, forms, supplies, and the like–general road maps of cities and states relating to the company's business–stock and parts catalogs (not being kept by other departments and divisions)–copy of US Govt. Organization Manual – dictionary – filing manual – US Postal Guide–Rail/Freight Classifications–

listing of combinations to safes and key numbers for all locks in use—inventory of locally developed and/or purchased forms and form-letters with one copy of each—copy of the Federal Register dated August 28, 1956 (outlines retention period for all records of interest to the Federal Govt.).

PERSONNEL:

Seniority lists—job descriptions—roster of employees including home addresses, telephone numbers, job numbers and payroll numbers (assuming payroll does not show similar data)—roster of employees presently members of the Reserve or National Guard.

Vital Records Storage Center (Method of Protection)

Protecting your vital records is a variation or combination of evacuation and duplication. Here are four sound principles, all but the first one requiring the establishment (or rental) of a special storage area:

a. **Internal dispersal** . . . the keeping of duplicate copies in two or more separate locations. For example, the "X" Ink Company is a multiplant firm with a home office in Boston and 18 branch offices located in small towns throughout the South and Mid-West. The home office of course is located in one of the several "target cities" announced by FCDA. At the home office the original record is kept but a copy is sent to the branch office located in Mudville, N. Dakota.

b. **Evacuation of existing copies** . . . transferring to established (or rented) records storage center. For example, the fourth copy of each invoice can be sent by the Sales Department and kept only as long as the time between trial balances.

c. **Evacuation of originals** . . . transferring to the center originals which have a very low reference rate such as the general ledger after being closed two years. This third technique is the most economical as it eliminates any reproduction costs and the requirement to maintain duplication. Another example would be the originals of all minutes of meetings for board of directors dating from conception up to about 1953. Any "old" historical records are another file-series that could be sent.

d. **Duplication of the originals** . . . this calls for making one additional copy in *addition* to the number needed for *regular* transactions. It can be either a carbon copy, a photocopy or a microfilm print. This last technique, of course, is the most expensive of the four so be sure to analyze the various types of reproduction methods, especially microfilm (as not everything HAS TO BE MICROFILMED). If microfilming has to be done here are three ways:

(1) by outside contract
(2) internally using rented equipment
(3) internally using purchased equipment

Some of the basic supplies and equipment that should be stockpiled at the Center include:

file-folders and charge out cards; sorting devices; filing cabinets, corrugated cardboard containers, safes (Class "A"); reproduction machines, microfilm reader; 3 ring binders; blank forms, blank telegrams, and stationery; clock; stapling machine; flashlight, gasoline lantern, first aid kit, fire extinguishers, hand tools; map measurer, map tacks, colored crayons; mailing tubes; rations, cookstoves, portable radio; rope and twine.

Containers for housing of records at the Center will range from microfilm storage cabinets (especially made to insure a 40-50% humidity condition), Class "A" safes (which provide protection for 4

continued

hours under severe fire conditions) to inexpensive double-thickness, corrugated cardboard containers. Gummed labels can be used to identify contents of each drawer or carton.

The National Archives and Records Service of GSA, a leader in government records management, conducted fire tests on these cartons and reports: "tests have convinced us that corrugated containers are best for records storage purposes and under no circumstances could we consider wood for the purpose because of the excessive heat and resinous gases it generates in a fire". For further details on the few limitations to these cheap cartons (about 15c) see pages 78-79 of the *Harvard Business Review* for July-August, 1956.

Storage Requirements

Your records storage center should be in a location, handy to transportation, but at least 50 miles from a "target city" or a major military/AEC site. The type of building should be one-story, fire-resistant, with few windows, high ceilings, (to allow installation of 8-10 shelf high steel shelving, doubled back to back) and having these facilities:

vault area . . . general work area for accessioning and disposal actions . . . employee reference room . . . supply storage area . . . reproduction facilities . . . telephone connections . . . fire alarm system . . . sprinklers . . . eating and toilet arrangements.

Of course, the site must be free from dangers of overflowing streams, and other flood conditions; not be adjacent to a fire hazard such as a junk yard of a chemical firm; and be manned by at least a few employees for guard and reference services.

Some smaller firms cannot afford to expend much money, so many are entrusting their vital records to banks located in rural area. Others are combining and pooling their resources.

Another idea concerns the rental of such services, from commercial facilities especially organized for this protective purpose. Some offer just the basic storage setup while others cover all phases from delivery, to reproduction, even to living facilities for key management. The Recordak Corporation is one such firm that operates a comprehensive security program for records protection using microfilm images. Three such underground areas are in business, each equipped to store film in controlled temperature/humidity conditions plus offering physical safeguards through uniformed guards and even having reserve generators, foods, water supplies and the like so as to insure self-sufficiency should regular facilities be cut off.

You must guard against making your Center an unwieldy accumulation of paper material rather than a collection point for selected data. Turnover is a necessary function for the bulk of your center-holdings . . . as data becomes obsolete or superseded by new information, then the old papers should be destroyed. Of course, no disposal takes place for any records earmarked in your records retention schedule as "permanent". If this turnover does not occur, you are shifting the emphasis of this entire records protection program from preserving pieces of vital information to pieces of paper.

Complete Inventory

One must not overlook the urgent need to have a complete (brief) inventory and index of what vital records are in center storage or being kept by "safe" field offices. It is highly probable that new personnel, unfamiliar with your customs and procedures will be involved in the reconstruction work. A simple shelf-listing should be developed with copies kept at the Center, at another distant location and of course at the home office under the custody of the Vital Records Officer. The inventory

should be composed for *each* separate "operation" (Fiscal—Sales—Engineering—etc.) as follows:

Carton drawer no.	Brief description of records	Date range
116	Annual Reports, printed,, bound	1912-1954
117	Transfer of Authority File	1956 only
118	Minutes of Board of Directors' Meetings, typed, looseleaf filed	1917-1934 and 1941-1955
119	By-laws, photostat copies	1911 only

The investment made for protection of your vital records is very similar to the long established custom of insuring the plant and key personnel against disasters. Regardless of cost (although there are many ways to keep it low), you have NO choice in this regard.

Putting off this program until "tomorrow" is a major reason for being caught short when misfortunes such as these occur: *fire—inundations—hurricane destruction, yes, perhaps even bombings.*

Intelligent plans and positive action are essential if you are to give your business a reasonable chance of survival and recovery. The time is NOW.

Catastrophe does not send an advance warning; rarely would you have even a two hour alert. Good intentions cannot possibly compensate for the loss of years of effort, investment, know-how, and skill.

It is incumbent upon the Systems man to sell this idea to top management; to plan the protection of vital records just as thoroughly and efficiently as a plan involving the production and marketing of a new product.

Did you know the fellow who said . . . our company was in business over there for about 175 years, until

The more we sweat in peace
the less we bleed in war. **s/p/a**

CHECKLIST

ITEM	*YES*	*NO*	
1. Will your firm have a different "mission" in wartime?	____	____	1.
2. Has a key official been appointed as Relocation Planning Officer?	____	____	2.
3. As one of his principal assistants, has a Vital Records Officer been appointed?	____	____	3.
4. Is there a list of vital records for each major function of all your operational departments?	____	____	4.
5. Is there a central point for the collection and processing of vital records for subsequent transfer to the Center or to a "safe" field office?	____	____	5.
6. Has a record storage center been selected (established or rented)?	____	____	6.
7. Does the Center contain necessary equipment and supplies?	____	____	7.
8. Is there a published, company-wide, manual or directive on the matter of records protection?	____	____	8.
9. So you have a plan, has it been tested this year?	____	____	9.
10. Have key employees participated in any dry-run of your plans?	____		10.
11. Is it true that you have done nothing to preserve your records?	____	____	11.

EDP is having a more profound effect than any other business data improvement

Electronics Unifies Management

► The application of electronic equipment to the processing of business data problems gave rise to a reconsideration of the relationships existing with respect to certified public accounting firms which were responsible for auditing and certifying financial statements. Coincident with this advance in business data processing there also arose a need for some kind of technical business data processing advice which would be available to the business executive. Except for the largest corporations which could appropriately assign individuals to investigate and evaluate situations developing as a result of this new technology, management was faced with the problem of self-education in this new field coupled with a need for advanced technical business data processing advice.

National and regional professional organizations like the American Management Association, Controllership Foundation, Systems and Procedures Association, and others immediately moved to fill the need for the business executive's desire to become acquainted with the rapidly spreading subject of electronics. Through conferences, seminars, and meetings the latest information was exchanged, and particularly in the early days, much "blue sky" conjecture took place. These joint gatherings emphasized the need for someone to turn to for counsel and guidance concerning the basic approach to the new technology and specific business problems.

Many of the larger public accounting firms, having a genuine interest in the subject because of auditing techniques, established or extended management advisory services to include the field of electronic data procssing. This dual capacity provided an economically feasible means of developing a corps of experts to assist clients, while at the same time designing accounting and auditing techniques to keep pace with the use of electronic equipment. This situation has undoubtedly served to more rapidly advance the status of the accounting profession.

The medium and smaller size companies have found that the services of the large public accounting firms are able to fill this gap on an economical basis. In addition to servicing clients, many of these firms have also contributed greatly toward the advance of the science through the compilation and dissemination of material affecting the subject as a whole or more specific industrial requirements. For example, Price

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The author's opinions expressed in this article do not necessarily represent the official views of either Standard Oil or S.P.A.

by F. Walton Wanner

Relationships

Waterhouse and Company, Management Advisory Service, was perhaps one of the earliest to assist in the field, and their booklet entitled "Electronics—A Company Program" published as far back as November 1954, reviews the fundamental concepts upon which such a system is founded. Their recent pamphlet entitled "The Auditor Encounters Electronic Data Processing" indicates the extent to which attention is being given to the auditing viewpoint.

Haskins and Sells produced a very fine booklet entitled "Data Processing by Electronics," which outlined the fundamentals underlying the use of electronic equipment and the factors involved when considering the use of such equipment. It also explains, in a layman's language, the technical operation of a system and provides specific equipment information. An excellent treatise entitled "Electronics Applied to Business in the Oil Industry," prepared by the Management Services Department of Arthur Young and Company, was published as early as December 1955. This report was prepared to answer inquiries from specific clients but it is also of service to others, particularly in the oil industry.

The training of personnel in the various management services departments of the public accounting firms is comparable to that of individuals in the accounting and systems professions who are directly in the employ of the larger corporations. This venture into the fields of management consulting and electronic data processing on the part of these established professional public accounting firms will do much to further the complete transition over the years ahead from "bookkeeping" to complete, integrated, high-speed business data processing.

Widespread use of electronic data processing is having a more profound effect than any other given business data improvement in past history. The entrance into the flow of data development of an invisible recording of information is one which at first caused consternation on the part of those responsible for the examination and verification of financial results. The reliance upon accurate compilation of source data and the establishment of controls at the point of origin and throughout the operation will be more important than ever. We are sure that controls, tests, and checks will be developed which will adequately provide the public accountant with a satisfactory basis to substantiate the financial results. It remains to be seen in the long run how much effort will be devoted to the auditing and examining of the electronic machine programs themselves.

The first concern of an audit program involving electronic data processing equipment is the establishment of good, sound accounting controls over the basic source documents. This is to insure the

continued

correctness and accuracy of the input data in the same manner as is presently exercised in connection with punched card equipment. Auditors will still be able to check source data as in the past. Intermediate check points may be established which are compatible with the operational requirements of the respective applications. Normal records, printed out in the course of processing the data, will be available for examination. No doubt, complicated and complex test cases incorporating all possible variations will be developed by the examining accountant to be used to verify the accuracy of the program and machine instructions. Specific auditing runs and machine programs should not be required. The establishment of the electronic processing interests in the public accounting firms, management advisory groups, will materially speed the elimination of any excessive recording and processing solely for the use of the auditor.

Generally speaking, electronic data processing is most helpful in two broad areas of business activities, that of operations and that of accounting or business recording. The former area could be defined as including all those aspects relating to research, engineering, and the use of mathematical techniques to solve problems in these fields, while the latter might be construed broadly to include that which is presently termed accounting, and the development of so-called statistics and data normally thought of in connection with office operations. The operations research, or scientific approach, involving the application of mathematical techniques such as linear programming may be appropriately applied to either broad field and utilized in problem solving. As advances are made in the use of operations research to define and solve problems in all fields with an increasing frequency of overlapping areas of management authority, the need for a strong overall responsibility will develop. This may ultimately result in a new high-level management function.

Mechanical data processing—punch card accounting—has for the most part been a responsibility of the comptroller. This organizational structure will probably continue for electronic data processing as the management organizations keep step with advancing developments and broadened responsibilities.

Electronic data processing and communications techniques will ultimately influence company organizational structure. The extent will depend on all the circumstances in each individual case. Perhaps the best analogy that can be made in the infancy of the electronic data processing technology is that of the punch card data processing.

To some extent accounting or statistical compilation was centralized, but more frequently the integrated subordinate tabulating installations were established in already decentralized organizations. Such subordinate installations were planned in such a way that the output—frequently in the form of cards themselves—became the input of a consolidating operation at the next level. This approach was not deleterious to decentralized management; contrarily, it strengthened the position of the decentralized organization. It permitted local managements to obtain adequate information much more accurately and faster than possible under manual methods.

On the other hand, it is possible to centralize data processing without centralizing decentralized managements. The mechanics of data processing, whether they be mechanical or electronic, need not affect operating administrative policy. Furthermore, there is generally in each fact situation a point—somewhere between complete centralization of data processing and complete decentralization of data processing—at which regionalization of certain specific types of data processing is very practical.

This is particularly true where there is a tremendous volume of data with a nominal value associated with each item—for example, a utility company's consumer invoicing operation.

Among the factors influencing the decision to centralize or decentralize data processing are:

volume of data to be processed
intricacy of calculations involved
size of decentralized operation
communications
geographical distribution of operations
multiple use of smaller computers vs. single use of one large computer
location relationship between information and need for information
relationship of local vs. central management requirements
consistency, speed, and frequency requirements for information.

What do companies think today about the effect of electronics on centralization vs. decentralization? A survey, reported at an office automation conference in Chicago, indicated that out of about 115 companies replying, 21 presently centralized expect no organizational changes. Out of 94 now decentralized, 34 expect no organizational changes, while only one anticipates drastic organizational changes.

Electronics will support an efficiently organized decentralized management structure by consolidating routine accounting and clerical work with resultant improvement in job level, responsibility, and satisfaction. The control of decentralized activities will be improved and new tools and techniques of management control developed. The net result will be managements freed of many minor but time-consuming responsibilities and provided with more time for creative thinking, operations and personnel development activities. All these lead to better managed decentralized operations.

The broad interest which has been developed and is increasing in its intensity with respect to the use of electronic equipment for business data processing is such that management need not be "sold." Top management is well aware of the potentiality of electronics in business from publicity appearing in magazines, newspapers, and through personal contacts with associates. It behooves those in the systems and methods and accounting fields to acquire sufficient knowledge of the intricacies of the subject to be in the position to appropriately advise top management.

Investigate and Study

It is not unknown for management, whose energies are not equalled by some systems people, to suggest that steps to advance be taken immediately. The embarrassing position of the systems people can be completely eliminated if new developments and current techniques are continually under investigation and study.

It is proper, however, that within corporate organizations the systems people develop a sound information program to acquaint all levels of management with the specifics of the electronics field as they most appropriately apply to the company. Indoctrination programs not only for management, but for all the employees certainly will have a place as the technology advances. The systems and methods people have an obligation to their management to keep it currently advised of the developments and help avoid any serious pitfalls which might otherwise occur. Embarking on a program in this field is a joint venture between management and the systems and procedures people—the complete confidence and backing of top management is essential to the successful culmination of an electronics program. The systems profession does not deserve this confidence and support if it is not equipped to meet the challenge. **s/p/a**

Business advances have added to the auditor's responsibilities

The Internal Auditor and Electronics

by Charles E. Grody

► It is a pleasure to address you this evening to discuss the relationship of electronic data processing and the internal auditor. I am grateful to your chairman for the invitation extended to me.

The theme of my remarks this evening centers around the position of the internal auditor in a company using electronic data processing equipment.

It would be sheer hypocrisy were I to classify myself as an expert on electronic equipment, or were I to seek to create the impression that I am a skilled technician in the field of electronic data processing. I am not! I am, however, an internal auditor—and my company has installed and is operating an electronic data processing system.

The giant size of some of these multipurpose machines and their present cost place them beyond the normal requirements of most business organizations. But their use is spreading. They have already proven themselves in government and military installations where processing of huge volumes of statistics or scientific data is required. An indication of the increasing recognition being given to this phase of business and industry is the number of large scale business organizations that are now actually utilizing such systems or have placed orders for them. I might add that these business organizations do not have reputations for throwing money away.

The traditional responsibilities of the internal auditor have been the safeguarding of the assets of the organization and the preservation of its income. These are still his responsibilities. However, the increasing complexity and vastness of modern business organizations, as well as the technological developments in business methods, have added many facets to the auditor's responsibilities. Because of the massive volume of repetitive transactions processed through the electronic data processing machine and the disappearance of certain visible audit trails, the auditor will have to show more ingenuity than ever before. But I say emphatically that this hardware will not eliminate the auditor. As an effective part of management, which today

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must rely upon numerous reports and analyses prepared by various departments throughout the organization, he will continue to examine and interpret basic evidence, constantly review and appraise the company's system of internal control, and furnish management with an independent appraisal of certain of the company's policies and practices. Thus, I reiterate, there will be a continuing need for auditors, more so than ever before.

To properly discharge these responsibilities the internal auditor must have certain attributes and must be so established within his own organization that he has the degree of independence sufficient to permit independent appraisal and reporting.

In my Company, the independence of the General Auditor has been established by the provisions in the Board of Directors' Rules and Regulations which provide that:

"The General Auditor is responsible directly to the Board of Directors through the Auditing Committee, and has been given the authority and duty to make audits, examinations and inspections of the financial operations and affairs of the Company on his own initiative, and to report to the Auditing Committee on such audits, examinations and inspections as may be made by him and to file copies of reports with the Chairman of the Board and the President."

Although the auditor's position is not the same in all organizations, in my opinion the ideal set-up for an auditor is for him to report to the Board of Directors either directly or through an Auditing Committee of the Board. Such an arrangement emphasizes his independent status and enables him to perform his duties more effectively. A parallel might be drawn between the position of the auditor in my Company and the recommendation of the Hoover Commission that the United States General Accounting Office be divided into two separate units, one of which will be under the direction of the Comptroller General, and the other an independent unit under the supervision of a General Auditor who will report directly to Congress.

Let me also comment briefly, for some of you who may have only limited contacts with auditors, on some of the more important qualifications of the auditor.

The ideal auditor should be well educated in the fundamentals of his profession including such subjects as accounting, auditing, commercial law, finance, economics and the liberal arts. At the same time, he should possess those attributes which might be classified as inherent—approach, appraisal, understanding, determination, diplomacy, initiative, imagination, independence, thoughtfulness, thoroughness, tact, originality, objectivity, and organization and reporting ability. I say this to emphasize that a good auditor is both a technician and a salesman, with, perhaps, imagination and initiative being the most important requisites.

Very rare indeed are those individuals who possess an abundance of all of these qualities. In practice the need of them in one functioning unit is usually met by the work of the entire group, collectively.

Some of the foregoing qualifications apply as well to a systems and procedures analyst. It is my personal feeling that there should be more interchanging of personnel, generally, between systems and procedures departments and auditing departments for their mutual benefit.

Of particular interest to auditors has been the development and application of electronic data processing equipment in business, because of the effect this equipment will have on the physical form of basic business records and the procedures which are subject to review by internal auditors. This electronic equipment undoubtedly is one of the most far-reaching developments which have taken place in recent years.

continued

As I have stated previously, the New York Life has installed and is operating an electronic data processing system in its Home Office. Our Company is a fair-sized organization, with over 6 billion dollars in assets and with approximately 17 billion dollars of insurance in force for approximately 5 million policy owners. Each working day we invest over 2½ million dollars in the nation's economy. We have 200 field offices and 200 correspondents located throughout the country. Six thousand agents and 8,800 employees comprise our man-power. Also, we hold in excess of 150,000 mortgages, own and operate several housing projects, and have numerous equity investments. This should give you some idea of the volume of the transactions necessary in such an organization.

Incidentally, the New York Life Insurance Company's auditing staff comprises 50 people only, including several stenographic employees.

The electronic equipment takes in its stride the verification of data on records of newly issued policies. It has shown that it can cope with more than 100,000 different classes of policies which the New York Life has issued during the 112 years it has been in business.

The system has already proven itself by calculating the premium rates and monetary values for an entirely new series of term insurance plans, months ahead of schedule.

It has enabled us to render more service to a greater number of policy owners and has helped us to broaden the scope of sound insurance protection.

I am certain that many of you know a great deal about these machines and their capabilities, and it would be repetitious for me to review their features. It is sufficient for my purposes to emphasize that, while these electronic machines are truly awe-inspiring, like any new and radical development their application involves the possibility of great advantages and certain disadvantages. The principal advantages, of course, center around the ability of the equipment to handle transactions at speeds that are incomprehensible except to engineers. This speed can be utilized in many ways: to produce records more rapidly; to develop more records; and to make various comparisons with assigned norms so that unusual transactions may be highlighted. Coupled with these direct advantages are the benefits that come with the appraisal and revision of systems and related controls preliminary to machine installation.

Possible disadvantages center around overreliance upon machine results as a substitute for judgment, and use of the marvelous speed of the machines to produce stifling volumes of reports and records. Of direct interest to the internal auditor is the possible substitution of machine "memory" devices for immediate accounting records, with the result that there may be apparent gaps in the audit "trail."

From the beginning of the development of these machines, and especially since the installation of the electronic data processing system in my Company, there has been intense interest on my part as to the exact manner in which the audit function would be affected when an electronic machine is the intermediary between original records and final results in such forms as payroll checks, operating reports and accounting records. Would there be a gap in the sequence of recording and control that may be traversed only by those who are expert in the mystic field of programming, magnetic tapes and magnetic cores? Or, were these machines to be regarded more or less as high-speed tabulating machines that would do the same things other machines had done, with the principal differences those of speed and the mystery of electronic operation?

It is hardly conceivable that any of us

would plunge forward into a field in which such revolutionary changes are forecast, without first considering the magnitude of the problems which confront us. As an illustration, I have chosen several of the more vital questions to which I must obtain answers.

1. Will changes be necessary in auditing techniques to cope with the installation of electronic data processing equipment?
2. How can the auditor employ the capabilities of electronic data processing equipment for purposes of record verification?
3. What problems will be presented by the staffing or restaffing of the Auditing Department?
4. What staff training programs must the auditor institute to cope with this new type of equipment?
5. How much time must the auditor spend on the technical details of electronics?

It is obvious that the ultimate answers to all of these questions are not available to us as yet, although we may formulate certain preliminary conclusions. Let me take these questions individually and attempt to offer specific answers where possible, and furnish certain information as to what we have done in the Auditing Department at the New York Life.

1. Q. Will changes be necessary in auditing techniques to cope with the installation of electronic data processing equipment?
   A. Certainly, the techniques of the auditor must be changed to meet the challenge of electronic data processing. The thinking of the auditor must be sufficiently flexible to recognize that his techniques cannot remain static. Dynamic thinking and greater ingenuity must be displayed to a more marked degree than ever before if the auditor is to maintain his position as an important aid to management.
2. Q. How can the auditor employ the capabilities of electronic data processing equipment for purposes of record verification?
   A. It is apparent that the scope of the auditor's work will be broadened considerably with the introduction of electronic data processing equipment. Additional tests and analyses, which previously were impractical because of the volume involved, may now become practical and permit more complete verification. It is in this area that a general knowledge of machine programming becomes an essential part of the auditor's technique. Such training, coupled with the auditor's required understanding of his company's operations, will enable him to serve a valuable role in interpreting, consolidating and streamlining the various functional programs.
3. Q. What problems will be presented by the staffing or restaffing of the Auditing Department?
   A. In line with the increasing technological problems brought about by office automation, the auditing staff at the New York Life has been augmented by the employment of individuals possessing skills of a more technical and specialized nature. As the scope of the auditor's work expands through the use of electronic data processing media, it is probable that the abilities of such individuals will be required in order that he may carry out his assigned duties.

   I feel that the auditor's staff should be a training ground to which management may turn in seeking qualified personnel to fill responsible positions in other areas of the company. To avoid depletion of the staff as a result of such a policy, it will be essential that all members be

continued

sufficiently versatile and trained, and that acceptable applicants have the potential qualifications to satisfy the requirements of management.

4. Q. What staff training programs must the auditor institute to cope with this new type of equipment?

   A. Staff training programs are essential in any auditing department. The installation of electronic data processing machines creates the need for another component in the established training program. This additional training, as I see it, must embrace the fundamentals of machine operations, programming and a thorough appreciation of the equipment's capabilities and potentialities. The equipment manufacturers provide certain basic training courses which we have supplemented by departmental sponsored educational programs.

5. Q. How much time must the auditor spend on the technical details of electronics?

   A. The time will vary in each company according to the size of the company, the extent and scope of its electronic installation, and the responsibilities of the auditor in the company.

The controls associated with the electronic system itself usually comprise the controls built into the machines by the manufacturers and those built into the programs by the programmers. However, this does not relieve the auditor of the responsibility for evaluating the internal control outside of the immediate area of the electronic data processing machine.

Using the questionnaire technique commonly employed by many auditors, and applying his knowledge of electronic data processing machine operations, he may, for example, develop the following internal control questionnaire:

A. *Organization*
   1. Does the plan of organization provide for the segregation of the following responsibilities:
      a) Authorization and executive review
      b) Accounting and machine processing
      c) Custodianship of funds and distribution

B. *Conversion*
   1. Will master file data be obtained from sources of proven accuracy?
   2. Does the company plan a period of parallel operation?
   3. During the period of conversion, will the two systems be compatible as to company policy and accounting data?

C. *Machine Operation*
   1. *Input*:
      a) Does the system provide for checking prior to conversion to magnetic tape, of the completeness and accuracy of input data?
   2. *Machine Processing*:
      a) Will tape storage and tape identification routines preclude erroneous processing?
      b) Will the various computer programs provide for appropriate self-checking instructions?
   3. *Output*:
      a) Will the conversion of information from tape-to-card or tape-to-printed forms be checked by items count and/or control totals?
      b) Will printed records and reports provide an adequate audit trail?

The auditor must be aware of the different types of controls that can be built into a data processing program and should take steps, particularly at the time of conversion to an electronic system, to see that the programmer is making full use of the types of checks available to him. These

controls, or some of them, are desirable in virtually all programs in spite of the inherent degree of reliability of the machines themselves.

The internal auditor must carefully review the internal control aspects of each electronic installation with which he may have to deal, and organize his approach to insure that he thoroughly understands the essentials of controls which exist, or the weaknesses, if any. He must satisfy himself, also, that the conversion process has been accurate.

Specific questions may also be asked with respect to specific work areas, such as premium billing. A few of these questions may be:

1. Are the policy numbers of all premium notices accounted for at the computer center?
2. Are the premium notices summarized and totals thereof furnished to the accounting department by the computer center?
3. Is a complete, visible record of all changes in master tape information automatically produced by the computer?
4. Is the detail of the master file, particularly premium rates, checked from time to time by someone outside the data processing department?
5. Are all exceptions to master file premium rates reported to an outside group for follow-up as to propriety?
6. Is the number of transactions in a batch, as reported by the agency offices, checked to see that all premium notices have been sent?

In many respects, the art of electronic data processing is in its infancy. The only general conclusion that can be offered is that electronic machines hold the possibility of better control and more effective operation than had heretofore been possible. These are certainly the objectives of every progressive internal auditor. Improved control brings the possibility that much routine verification may be handled in normal operations, with consequent lessening of this routine work by the internal auditor.

As I visualize it, the role of the internal auditor in this new era is one of paramount responsibility. I make this statement not to enhance the importance of my own position, but rather because I recognize that lack of vision on the part of the internal auditor can be a severe obstacle in the path of progress. If the auditor refuses to recognize that certain controls are no longer necessary or possible, he can seriously hamper the effectiveness of any suggested new procedure. On the other hand, if the internal auditor is alert to the capabilities of this new equipment, and dynamic enough in his thinking to realize that certain changes are necessary, he can serve a valuable role in the installation of the new procedures. With his required broad knowledge of his company's operations and basic policies, he can provide necessary information to effect an integration of similar functions, and he can greatly facilitate the smooth flow of data produced by the electronic data processing machines to the areas where it may be used most effectively.

Therefore, it becomes apparent that the position of the internal auditor in this electronic era is dual in nature. First, he must be prepared to provide advice and assistance in the establishment of new procedures based upon the use of electronic data processing equipment; and, second, he must revise his own techniques and approaches in order that he may effectively review and appraise the data produced under these new procedures.

In order to fulfill the first role in this dual position, the auditor must make a number of decisions which can only be reached after intensive research and analysis. The question of the extent and form of visual records which must be retained is one which will have far-reaching consequences. In this same area, considerable attention

continued

must be given to the problems of internal controls in an era in which the dependence upon human effort is decreased and greater reliance placed upon mechanical accuracy.

Another side to the auditor's position in the establishment of procedures concerns the analysis and interpretation of actual costs involved. As an advisor to management, it is his duty to be alert to increases in costs without commensurate increased benefits in the results derived. He must make certain that procedures which could be performed more economically and just as efficiently by other means, are not adapted to electronic data processing merely to use up available time.

These matters include only a few of the areas toward which the auditor's attention must be directed. Many other areas are already evident and, no doubt, still further situations will arise which will require careful consideration and analysis.

Increase work scope

The second phase of the auditor's position concerns the evolution of his own techniques in order to provide the means for effectively examining the results of operations. Certainly the new equipment should provide a means for the auditor to increase the scope of the work which he may perform. As I have said before, analyses and tests which, although desirable, were heretofore impractical because of the volume involved may now be within the realm of possibility. Increased confirmation of transactions, the extensive use of scientific random selection, the increased volume of transactions which can be tested are all means which must be explored for their possible value to efficient audit operations.

None of these matters can be subjected to a hasty decision. Only time, research and experience will provide us with the ability to reach our conclusions. The auditor must, however, be cognizant of his responsibilities and start immediately to prepare himself for his position of the future.

Conclusion

In conclusion, I would like to say that the computer is not an "electronic brain." It is rather a method of storing a vast quantity of information, processing it with lightning speed, and delivering the results quickly. Computers do not relieve management of making decisions. By providing more information quickly, they enable management to make *better* decisions. Electronic processing of problems containing hundreds of variables gives management immediate information needed for decisions. Such problems were considered hopelessly complex only a few years ago.

Electronic data processing is making New York Life a better place to work. It is taking over many repetitive and time consuming tasks thereby releasing people for more creative and interesting work within the Company. By encouraging creative activity, the electronic data processing machine is generating greater opportunities for careers vital to our economy.

I have attempted, in my remarks here this evening, to convey my concept of the internal auditor in relation to an electronic data processing installation. The area covered has been necessarily restricted to a few of the many facets of the problem. I fully realize that others in my profession may advance diverse views on the subject and that a great deal of deliberation and discussion will be necessary before the conclusions become definitive.

As I see it, the degree of success achieved in the installation of an electronic data processing system is based upon cooperation. The talents and abilities and special training of many individuals must be utilized in concert, and if these individuals recognize their responsibilities and are eager to do their part, success is assured and the rewards will be great. **s/p/a**

Book Reviews

Office Automation—*Integrated And Electronic Data Processing, by R. Hunt Brown, Published by Automation Consultants, Inc. $25.00.*

The literature on electronic data processing is fast assuming voluminous proportions. This has created several problems for the systems analyst who must keep abreast of current developments in electronic data processing while still performing the normal activities of his job. The dire need for a non-technical work on office automation in business language had become obvious and necessary.

The publication of "Office Automation" in 1955, provides comprehensive coverage, in one volume, of the commercial aspects of automation in the office. The original volume offered an updating service which consisted of monthly newsletters with new pages containing revisions and descriptions of new equipment and applications.

A new, updated edition of "Office Automation" has just been published incorporating all of these revisions and the recent developments in the field of Automatic Data Processing. The updated edition is one of the most comprehensive manuals on office electronics covering six phases:

1. Commercial aspects of office automation with explanation of existing applications and opportunities in the field.
2. The Hardware or the new office tools.
3. Electronic and Automatic Accounting applications.
4. Sociological Aspects of Office Automation
5. The new Scientific Techniques
6. Potential Applications.

As a reference manual the book is certain to become a standard in any systems man's library. The treatment of the subject matter covering the entire field of automation is most inclusive.

Professional Consultant's Operations and Techniques, *by C. C. Crawford, Los Angeles Chamber of Commerce, Los Angeles, California.*

This survey on the problems of the consulting professions was conducted by Dr. Crawford of USC for the Los Angeles Chamber of Commerce. While this 44 page report was prepared to assist the consultant to better service the client, it is equally of interest to systems people and management personnel who are often required to work with consultants. Several of the chapter headings are "How to sell your services to the Prospect", "How to Serve the Client" and "How to Administer your Consulting Operations".

How to Communicate Policy and Procedure, *by Joseph D. Cooper, published by the Bureau of Business Practice, National Foremen's Institute, 100 Garfield Avenue, New London, Connecticut. ($12.50)*

Here is one of those books that is so full of "meat" that it belongs in every systems man's library. Mr. Cooper wrote this book from the viewpoint of the man who must produce and maintain manuals. He shows specific ways that we can communicate policy and procedure information to all people in the organization.

Consider these sections: How to Plan the Systems . . . Examples of Instructions Systems . . . How to Write and Explain . . . Making Procedure Instructions Work . . . How to Get Approvals . . . How to Run an Instruction Program.

The book illustrates techniques of indexing and cross-referencing. It covers the numbering of pages of the manual, and techniques for "packaging" related information. Examples of such packaging would be placing all personnel matters in one section of the book. The author gives

continued

examples of simple writing and tells how anybody can write clearly.

"How to Communicate Policy and Procedure" covers such mundane but necessary details as proof-reading, the selection of the manual cover, distribution techniques, how to check the manual for accuracy, how to revise a bulletin, what to do about re-runs, and how to achieve good titles on each bulletin.

Accounting for Intra-Company Transfers, *published by the National Association of Cost Accountants, New York. Price $1.00.*

This study deals with policies and methods for pricing intra-company transfers of goods and services in order to determine profit performance of divisional management. The report presents practices of forty leading companies collected in field interviews by the N.A.C.A. Research Staff, reviewed and evaluated by an N.A.C.A. Committee on Research.

Principal topics dealt with in the report: (1) alternative pricing policies for intra-company transfers, (2) considerations underlying the choice of a pricing policy, (3) practical methods for pricing transferred goods and services, (4) techniques used in accounting for intra-company transfers.

Scientific Inventory Control, *by W. Evert Welch, Management Publishing Corp., Greenwich, Conn. 168 pages, 8½x11, price $12.50.*

At last there is an inventory control book which can be read, understood and easily applied by the purchasing agent, engineer and others associated with inventory problems. On initial examination this book gives the impression of being highly technical with difficult to comprehend mathematical formulas. In actual practice, the formulas are easily understood and can be applied without difficulty.

This book is a must for anyone responsible for inventory control and maintenance.

Worth Reading

"An Introduction to Administering the Accounting Manual"
W. G. Cole, *NACA Bulletin,* February 1957.
Describes Bethlehem Steel's system of applying frequent changes in an orderly manner to keep its accounting manual current. The detailed procedure with related forms is presented.

"Simple Forms You Can Make on Your Office Duplicator"
John Hockman, *The Office,* October 1956.
Detailed illustrated description of the variety of forms possible with regular office equipment. Explains how to combine type sizes, space bar and half-backspacer to produce varied effects. Describes how to prepare "justified" copy.

"The CPA Views Mechanized Accounting"
Ralph F. Lewis, *The Controller,* September 1956.
Considers these problems of accounting by computer:
(1) Determining correctness of source data before entry.
(2) Assuring that only approved documents are entered in the records.
(3) Making certain that processing procedures are correct.
Includes a progress report on recent developments in computers.

"Electric Versus Manual Typewriters"
John C. Carroll, *Office Executive*, January 1957.
Brief general statement of Carrier Corporation's policy of use of electric typewriters. They use the following criteria for evaluating requests. One of these conditions has to be met five hours per day: 1) For executive and sales correspondence where a high degree of uniformity is required 2) where more than 8 copies of a form are consistently required 3) where reproducible masters are prepared.

"They Eliminate 30,000 Chances for Error"
Joseph B. Dunn, *Modern Office Procedures*, January 1957.
Describes how a manufacturer of heavy machinery trained women office clerks to process orders accurately. A three-part program consisted of: 1) special training 2) simple classification of parts 3) microfilm equipment to enable clerks to quickly verify the parts in an order.

"How To Produce An Employee Handbook"
Robert C. Fouhy, *The Office*, August 1956.
Illustrated general discussion of handbooks used in industry. Covers style, preparation of copy, format and printing. Includes a detailed outline for a handbook.

"What Makes Up an Adequate Records Program?"
William Benedon, *NACA Bulletin*, August 1956.
Considers in detail the following aspects of a records program based upon experience at Lockfield Aircraft: development of a records retention schedule, establishing and operating a records center, use of microfilms.

"Why the Rush?"
Joseph D. Edwards, *Office Executive*, November 1956.
Recommends caution before claiming savings on new systems. Cites the case of a magazine article describing a revised reporting system with impressive savings. However, when the magazine wanted to do a follow-up article on the system, it discovered the system had been discarded and the author fired.

"Office Automation—How Far Have We Come Today?"
Office Management, February 1957.
Considers the broad implications of the impact of automation on the business world. Suggests that attitudes should be changed regarding what data is desirable in order to take full advantage of the possibilities of automation. For example, we should prefer a relatively accurate picture of things on a current basis to an exact picture of things as they were at some time in the past. The author also suggests that many companies have not yet designed systems which could permit existing machines to complete a procedure cycle, i.e. after reviewing inventories machines should automatically prepare the orders needed.

"Sales Branch Inventory Control Procedures"
Maurice E. Karosen, *NACA Bulletin*, December 1956.
Describes a centralized tabulating system for maintaining stock in warehouses throughout the country. The method described is used by a pharmacal company. Billing procedures are integrated with inventory control.

On January 4, 1957, the First Convention of the Caracas Association of Systems and Procedures was inaugurated, with nearly 300 representatives from many different commercial enterprises present. The opening address, delivered by Dr. Ricardo Gonzalez, the president of the Corporacion Venezolana de Fomento, is printed here.

How Systems

► The dimensions and complexity of business in the modern world have compelled the different commercial enterprises to break away from the road of uncertainty and to use in its stead modern and well tested methods of management and organization. With such a purpose in mind, once the principal objectives of a business have been clearly defined, it is necessary to devise a set of policies which will lead to their attainment and to establish a system of methods and procedures by means of which the aims pursued may bear fruit.

If the objectives have been clearly established, defined and correlated, if the set of policies devised fits such objectives perfectly and if the procedures, norms and systems have been wisely chosen then coordination, efficiency and economy will become apparent as the logical outcome.

Before a business initiative can be successful all its objectives must be clearly and definitely determined, for a coordinated action without errors is impossible unless all the factors involved are well known. It is impossible to coordinate that which is not known and of which the magnitude and characteristics have not been considered. That which is not clearly understood cannot be managed successfully. The effectiveness of planning and management is directly proportional to the exactness with which the basic objectives have been apprehended and the capacity to understand and apply their inherencies.

An adequate statement of objectives cannot be made along the general lines, sometimes vague, which appear in the by-laws of many companies. It must specifically determine the immediate and future aims of the company and the relations existing among them.

Elaboration Of Policies

Once the objectives of the company have been clearly established and defined, a set of policies must be adopted to insure the orderly and harmonious unfoldment of its various activities.

In order to lend effectiveness to the task of coordinating efforts, it is necessary to select the best among all the different known methods to attain a certain end. For every problem there is a solution, an alternative solution and variants of both of them which must be considered in themselves and in their relation to one another. These relations must be clearly apprehended if one is to be able to control their effects and to use them profitably in the pursuit of the objectives of the company.

A good set of policies must not only contemplate present needs but must also

by Doctor Ricardo Gonzalez

s Complements Management

project itself into the future to take care of any contingencies and permit control over situations which might very well arise. The economic phenomenon is essentially dynamic in character, for it is affected by innumerable variable factors, some of which can be foreseen but not determined, while others spring from causes impossible to establish ahead of time. All determinable factors as well as those that cannot be readily foreseen must be taken into account. In order to be ready for the latter, a safety margin is adopted. If the variable factors are apprehended sufficiently ahead of time, some of them can be avoided and others can be satisfactorily modified when choosing the most convenient alternative.

The object of a policy is to minimize the friction, the confusion and the losses resulting from the variability and complexity of the factors which enter into play in this process.

It is the job of a policy to substitute chance with definite plans based upon a careful appraisal of the systems and procedures adopted to attain the objectives of the company.

Organization and Management

I will now try to explain how management, and systems and procedures, complement each other in the activities of a business enterprise whose unfoldment requires the utilization of methods, personnel and machinery.

Organization is the structure of a business enterprise and the logical coordination of its various activities. Some authors are wont to consider organization as a dynamic process always on the verge of renovation, instead of considering it a correlation between the different factors of the business enterprise, within which the process is taking place. Others define organization as a relation between the different functions and factors of a business enterprise.

Every bodily function requires for its fulfillment the action of a specific organ. In all business enterprises a phenomenon similar to that occurring in the human body takes place and therefore every function presupposes the existence of a specific organ for its fulfillment. That section in charge of all the organizing functions of a business enterprise is management.

Management and Systems

It is generally believed that management is a conscious and systematic process which regulates the activities of the business enterprise in its efforts to accomplish, produce and attain certain ends.

Management fulfills the specific function of insuring the occurrence of certain events

continued

within the orbit of a series of pre-established or foreseen facts. Every decision or action on the part of management has as its primary manifestation an economic dimension.

Logical Thinking

In order to secure a maximum of efficiency, management must act in a well organized and systematic manner. Even though its functions be related to one another and turn out to be mutually dependent, specialists on the subject generally list them as follows:

a. To consider and study objectives
b. To establish and define the objectives
c. To plan the organization
d. To adopt norms and procedures and to select systems
e. To elaborate working plans
f. To appraise results
g. To decide upon a plan of action and carry it through

The fulfillment of the functions hereby specified requires an aptitude for logical thinking and a rational and systematic criterion. Every manager must have a gift for firm and methodical thinking. Whence the functions of Management overlap with those of Systems and Procedures.

Systems and Procedures

The structure and the organizing staff of a business enterprise comprise the following:

1 *The personnel or human force which determines and attains the objectives, establishes relations and links facts and events.*

2 *The structure, meaning by this the location, order, shape, size and relation of the component parts of the business. It is an inert section of the enterprise.*

3 *The procedures, norms and systems which coordinate and guide the activities of the personnel in their efforts to attain, with a minimum of exertion and maximum efficiency, the objectives pursued.*

Personnel

The structure and the administrative methods are not capable of achieving results by themselves. The presence of the human element to perform the tasks, utilize the means and apply the rules and systems is absolutely essential.

The most perfect system is doomed to failure when the employees in charge of putting it into effect lack the necessary knowledge and experience to make it workable and practical. To quote a sharp remark by Seidman: "An ounce of care in selecting and preparing the personnel is worth far more than a ton of internal supervision". If we create a good organization, in which the systems and procedures are efficiently employed, we cannot do better than to pay the most careful attention to the selection of our personnel, for it is they, in the end, who carry out our plans and give impetus to our business.

Since the personnel is the most valuable element among those participating in the economic process, and this is a truth universally accepted, management should do its best to take all possible measures to make their task more agreeable. Management should offer worthy employees the opportunity to develop their aptitudes through training programs, benefit plans, scholarships, etc. The relations between management and personnel must be fair and impartial. The salaries should be the highest that the commercial stability of the business permits.

At the executive level, it must be constantly held in mind that the only recognized authority is that of knowledge. Each function entails a certain degree of authority and responsibility. Every man must bear as much responsibility as that entailed by the function he fulfills and therefore authority should equal the weight of his responsibility. That is to say, the extent of his authority and responsibility must be the same. Authority is effective only when

it is exercised by the person with the greatest knowledge of the problem at hand, be it in management, production, auditing or finances, and possessing the greatest capacity for using his knowledge intelligently. In modern business, authority must not only be associated with the position held but also with the individual's effective capacity to fulfill his function.

The C.V.F. organization which I have the honor to preside over, considers training programs for executive personnel of the greatest importance. We are convinced that they constitute an indispensable factor in the preparation and performance of any plan or program whatsoever, and in their stability and unfoldment. It is the task of the executive personnel to instill faith, enthusiasm, vitality and a spirit of accomplishment in the minds and hearts of their subordinates. Without these qualities, no business enterprise will be able to survive, regardless of its size and financial resources.

I firmly believe that all commercial enterprises besides producing tangible things should develop executive talent and create new specialists and more expert professionals. It is thus that spiritual values and material goods are created.

Administrative Methods

Our experience and others' clearly indicate that it is just as important to know exactly WHAT we wish and can accomplish as it is to know with the same degree of assurance HOW we are going to do it.

What do we mean by HOW? We mean an exact knowledge of that conglomeration of general norms, systems and procedures which guide and condition the orderly and harmonious unfolding of the activities of an enterprise in its efforts to attain its objectives.

The end pursued by private industry is to obtain the best possible results, utilizing the means at its disposal. This cannot be attained without a better organization capable of rendering better service at a smaller cost. This permits the rapid growth of the business, an increase in profits, and the general well-being of everyone concerned.

In other opportunities I have pointed out the great similarity existing between a manager and an orchestra director, who through his efforts, vision and leadership is able to create harmony and beauty out of the sounds coming from a great number of different instruments. Just as the orchestra director utilizes certain means to achieve powerful, coordinated and satisfactory results, so does the manager make plans, weigh results, establish objectives and make use of logical and adequate systems and procedures to attain his ends. The entire process entails a series of interrelated steps whose influence upon the final outcome cannot be left to chance. These steps include not only those not requiring machinery but also those which utilize common and electronic power. These instruments of management must be intelligently systematized, coordinated and applied.

Even though management is directly responsible for their adoption, their study and preparation is becoming more and more a specialized task. Their preparation is specifically assigned to the appraiser of systems and procedures, a task the importance of which is becoming more and more recognized. Due to the larger number and complexity of the functions of management, this Organism requires the constant counsel and assistance of the Systems Engineer and of the appraiser of organizations and procedures. Their qualified assistance and advice is invaluable in the adoption of plans to meet the needs of the enterprise and in the setting up of efficient methods to attain the objective pursued.

The great problem confronting the Systems Engineer is to succeed in having his ideas accepted and applied just as he conceived them. To attain this he must exercise the greatest tact and must be able to

continued

recognize without the slightest mental reservation that the final decision rests upon the manager, who will assume full responsibility for any modification in the structure and functions of the organization.

The ever larger field of action of commercial enterprises together with the immeasurable increase in the volume of their operations has compelled industry to utilize more and more mechanical equipment. This equipment is a valuable aid in the simplification of work and in the elaboration of timely and accurate reports. This process of mechanization has grown from the use of typewriters and calculating machines to the employment of modern and complex electronic equipment. Now we have mechanical brains which are capable of solving the most intricate problems in a minimum of time thus saving us a great deal of effort.

It is up to management to decide when the time is ripe to introduce new machinery. They must be sufficiently open minded to accept new inventions and changes, for they are very common in this field. Present machinery becomes obsolete very rapidly and we must be ready to accept all reasonable innovations in order to increase our efficiency and profits. In this field, as in all others, we must not let routine and inertia take the upper hand. We must welcome changes and find our way with the help of new ideas.

The use of mechanical equipment is so common and its variety so great that we are led to believe in a new industrial revolution which will practically eliminate the use of man power. The possibilities of mechanization are innumerable. Nowadays, a knowledge of the use of mechanical equipment requires time and study. Experts in this field from the industrial and commercial worlds will soon be giving lectures and demonstrations in order to emphasize its importance in the modern business enterprise. **s/p/a**

An editorial

The Genie

WHY HAVE THE TOP EXECUTIVES of American business, who have so long been indifferent to the systems man's struggle to integrate their companies' clerical effort, suddenly had their imagination captured by the EDP complex? In developing the thesis of his latest work, "Integrated Data Processing for Every Office" (published by Office Research Institute, Miami, Fla., 1957), H. John Ross, a pioneer in the field of systems teaching and writing, lists four answers to this question. First, the mystery and glamour of such descriptive terms as IDP, EDP, ADP, etc., have intrigued all levels of management. Secondly, the extremely high cost of the electronic computers has put them in a price bracket with industrial production facilities, and thus made them worthy of executive attention. Third are the startling claims of savings, speed and output potentials. And finally there is the wide range of fascinating machines with their magnetic tapes, memory drums, and other "outer-space" terms.

But this bit of probing inside the brass hat is only supplementary to the author's main purpose which is to point out that the clerical house-straightening that is prerequisite to electronic computing should long ago have been recognized by the top executive as of greater value to his company's progress than the magic brain itself; and that, above all, the systems man should seize this opportunity, now that industrial leaders have turned their attention to data processing, to convince them that clerical operations should and must be handled on

Out of the Electronic Computer

a comprehensive company-wide basis.

Because data is processed in many companies today in accordance with the whims and prejudices of various department heads, Ross sees inconceivable costs being saddled onto the business operation. The same management which sees nothing strange in this situation would never think of permitting each department which processes the manufactured product to use its own judgment about dimensions, tolerances and operation sequences.

Mr. Ross strengthens his thesis by dissecting some of the startling claims of huge savings made by companies which have already put the electronic hardware to work. Not that he doubts the truth of their claims; he merely points out that the astronomical extent of their savings bears witness to the antediluvian state of their paperwork operations before EDP. He believes strongly that perhaps the major part of such latter-day progress could have been made long before the electronic age.

This thesis is by no means a new concept to the systems man, but nowhere is it so well presented and so firmly buttressed as in Mr. Ross's presentation. And the audience he is trying to reach is not so much the systems man as the business executive—and the former might do well to see that this little missive reaches its target, because the executive who reads, comprehends and is convinced of what Ross says will emerge with an enhanced view of the importance of the systems man to his company's fortunes. For the author minces no words in stating that once the executive realizes that all paperwork is interdependent, he must then progress to the next logical step which is to recognize data processing as a vital function of the business organization, and to place it under a qualified manager who should be directly responsible to the executive head of the company.

Herein also lies a grave implication affecting the system man's future. Can he convince management to keep the electronic computer in its proper place as another tool to be used in data processing? Or will the glamour of EDP result in this tool being wrested from his grasp and cause him to evolve into a mere adjunct to the machine?

Incidentally, the author has something critical to say of SPA's definition of Systems as "an over-all pattern of action." His point is that it is not fair to criticize executives who fail to accord the systems function its appropriate place in the organization when the term "Systems" itself fails to convey the real significance of the activity, and has in fact been preempted by the industrial engineering profession. He reiterates his concept that systems covers all of the data processing in any organization and that it should be centrally controlled. His own definition of systems is "that which enables management to fulfill organization purpose."

Mr. Ross writes with conviction in his characteristically pointed and fast-moving style. To repeat, it's a bright little book to drop on the boss's desk. THE EDITORS

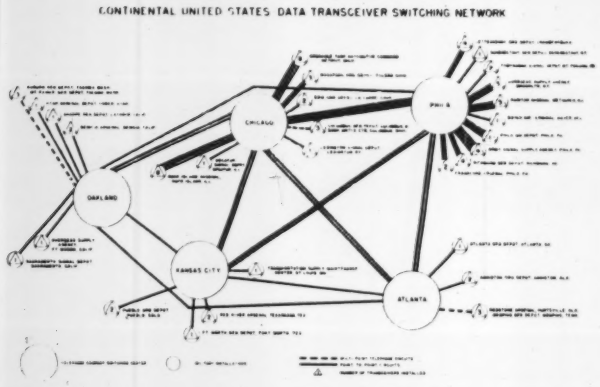

Chart shows the Continental United States-Data Transceiver Switching Network.

Army Streamlines Supply System

► Keeping close control of over a million items of Army equipment—from tanks to transistors—is the challenge facing today's modern U. S. Army.

To relieve this king-size problem, the Army Signal Corps and the Long Lines Department of the American Telephone and Telegraph Company are today operating a new electronic data processing network, designed to speed up the flow of supplies and keep stockpiling to a minimum.

The system named CONUS-DTSN, for Continental United States—Data Transceiver Switching Network, is the outgrowth of the "fast-communication" concept of Project MASS (Modern Army Supply System).

Telephone lines connect switching centers in Philadelphia, Atlanta, Chicago, Kansas City and Oakland. Interconnected to these centers are 33 military installations. Data transceivers of the International Business Machines Corporation are used to exchange information on punched cards between all network points. Cards punched at one end of a circuit can be duplicated rapidly at the other end using communications lines. An estimated million such transactions can be handled daily.

Processing of supply requisitions may be completed in 30 to 40 days less time than now needed. Requisitions which took weeks will be handled in days and those taking days will be trimmed to hours.

Savings are expected through greater overall efficiency and reduction of the time required to process and transmit information, requests, orders and reports. Further savings will result from the reduction of materials in supply pipelines and amount of materials stocked in depots.

Initial users of the network are Quartermaster, Ordnance, Signal, and Overseas Supply Agency in New York and San Francisco. Future users will include other branches of the Army.

One future use of the system will be processing of personnel assignments in the Zone of Interior and overseas. Electronic data processing and transmission will reduce by an estimated 30 days the time now needed for handling personnel transfers. Cards will be sent through processing centers and the men will report directly to their new assignments. It is estimated that over a million military personnel will be administered by this system. Later an additional half million civilian personnel may be similarly handled.

Studies are under way to determine how CONUS-DTSN can be utilized to ease the transition from peace to war in an emergency. **s/p/a**

One of five telephone switching centers interconnecting with 33 military installations.